

A.14 INTEGRAL ARCHIVAL AND THEORETICAL RESEARCH PROGRAM

1. Scope of Program

1.1 Program Overview

The INTERNATIONAL Gamma-Ray Astrophysics Laboratory (INTEGRAL) is a European Space Agency (ESA) operated observatory class facility which features state of the art imaging and spectroscopy in the 15-keV – 10 MeV spectral domain. The INTEGRAL Archival and Theoretical Research Program solicits grant proposals for U.S. participation in the INTEGRAL mission through the analysis and interpretation of publicly available INTEGRAL archival data and through theoretical research directly pertinent to INTEGRAL results.

1.2 The INTEGRAL Mission

INTEGRAL was launched in October 2002 and has been operating successfully since that time. It is a successor to NASA's highly successful Compton Gamma Ray Observatory (CGRO) mission offering more than an order-of-magnitude improvement in spectral and spatial resolution. This is achieved through the employment of superior technologies, including a germanium crystal spectrometer and a pixelated cadmium telluride detection system with 16,384 detectors (128x128) and electronic channels.

INTEGRAL carries two main instruments: the Spectrometer on INTEGRAL (SPI), optimized for high-resolution gamma-ray line spectroscopy in the 20 keV - 8 MeV range; and the Imager on Board the INTEGRAL Satellite (IBIS), optimized for high-angular resolution imaging in the 15 keV - 10 MeV range. Two monitors complement the primary instruments: the Joint European X-ray Monitor (JEM-X), sensitive to 3-35 keV X-rays, and the Optical Monitoring Camera (OMC) sensitive in the optical V- band. The spectrometer, imager, and X-ray monitor are all coded aperture mask telescopes. The coded mask technique facilitates wide field of view imaging and background subtraction. INTEGRAL's 3-day, 150,000-km apogee orbit, minimizes the effects of the Earth's radiation belts. A summary of the instrument performance characteristics is presented below. Further information on INTEGRAL, its instruments, and its mission may be found at <http://heasarc.gsfc.nasa.gov/docs/integral/integralgof.html> and <http://astro.estec.esa.nl/Integral/about.html>

INTEGRAL is an observatory-class mission, with most (currently 75%) of the observing time allocated to the General Program, which is open to the full international scientific community. The remainder of the time is dedicated to the Core Program, which includes periodic scans of the Galactic plane to monitor for transients and accumulate a uniform exposure and a deep exposure of the central region (approximately $-30^{\circ} < l < 30^{\circ}$, $-20^{\circ} < b < 20^{\circ}$). Typical INTEGRAL observations last from two days to about two weeks. All INTEGRAL data enter the public domain approximately one year after processing.

The U.S. community is supported by an INTEGRAL Guest Observer Facility (GOF) managed by NASA's Goddard Space Flight Center, and oversight is provided by a U.S. INTEGRAL

Users Committee (IUC). All publicly available INTEGRAL data products, software, and calibration files are available online via the INTEGRAL GOF, at <http://heasarc.gsfc.nasa.gov/docs/integral/integralgof.html>

All INTEGRAL data products for which the one-year proprietary period has expired are available for archival investigations. It is anticipated that all basic data products from the first one and a half years of the INTEGRAL mission will be in the public domain by January 2005. High-level data products such as flux maps and individual source light curves will also be available to facilitate proposal planning and preparation. The INTEGRAL Offline Science Analysis (OSA) software and associated documentation, maintained by the INTEGRAL Science Data Center in Geneva, is available for download through the INTEGRAL GOF.

2. Programmatic Information

2.1 General Information

This solicitation describes a new mode of U.S. participation in the INTEGRAL mission, involving the analysis and interpretation of publicly available INTEGRAL archival data and theoretical research directly pertinent to INTEGRAL results. Theoretical or archival investigations may be an extension of work associated with approved guest observations, or new self-contained proposals for the analysis of publicly available INTEGRAL data or for related theoretical research.

This solicitation is not for INTEGRAL observations nor for the support of U.S. investigators who have been awarded INTEGRAL observing time. ESA regularly solicits proposals for observations to be conducted by INTEGRAL. NASA will provide support for U.S. investigators who are awarded observing time on INTEGRAL by ESA through a separate solicitation from this one. This solicitation does not solicit INTEGRAL observing proposals, nor does it solicit proposals for the analysis of nonarchival INTEGRAL data.

It is anticipated that approximately \$500K will be available through this solicitation for the support of approximately 10 INTEGRAL archival and/or theoretical research programs, each of one year duration. These figures are guidelines; final award levels may differ substantially from these amounts.

2.2 Proposal Submission and Evaluation

IMPORTANT INFORMATION

As discussed in the [Summary of Solicitation](#) of this NRA, NASA Headquarters is now using a single, unified set of instructions for the submission of proposals. This material is contained in the document entitled *NASA Guidebook for Proposers Responding to NASA Research Announcement – 2004* (or *NASA Guidebook for Proposers* for short) that is accessible by opening URL

<http://research.hq.nasa.gov/> and linking through "Helpful References," or may be directly accessed online at <http://www.hq.nasa.gov/office/procurement/nraguidebook/>

However, owing to the need to provide electronic data bases both to NASA Headquarters for overall cognizance of its research programs, as well as to the INTEGRAL Guest Observer Facility, proposers are required to electronically submit proposal materials to two separate Web sites as detailed below, in addition to hard copies of the proposal.

2.2.1 Submission of Notice of Intent

In order to expedite the proposal review process and timely selection of scientific peer review panels, investigators intending to submit proposals for participation in this program are asked to submit a Notice of Intent (NOI) to propose, by the deadline stated below. Note that an NOI submission is not required, but is of considerable value in helping NASA plan for an expeditious peer review of proposals.

2.2.2 Submission of Proposals to the INTEGRAL Archival and Theoretical Research Program

Proposers are required to electronically submit proposal materials to two separate Web sites as follows:

- Complete and electronically submit a *Cover Page/Proposal Summary/Budget Summary* at the Web site <http://proposals.hq.nasa.gov> in compliance with Chapter 2.2 of the *Guidebook for Proposers*.
- Complete and electronically submit all required forms through the HEASARC Remote Proposal System (RPS) at <http://heasarc.gsfc.nasa.gov/RPS>. Detailed instructions are provided as part of the RPS site.

A complete hard copy proposal consists of:

- A Cover Page signed by the PI and Authorizing Official;
- A scientific justification section, not to exceed 4 pages in length (i.e. two 2-sided letter sized sheets including all figures plus text, minimum 10-pt font with reasonable margins);
- A budget prepared according to the guidelines of the PI or Co-I institution, detailing the requested itemized expenditures;
- A one page summary of the budget justification, including a breakdown of the work assignments for all funded investigators, justification of any major purchases including workstations, justification of foreign or excessive travel, publication costs, and any cost sharing applied to this project;
- A list of current or currently proposed research support from all sources for the PI and any funded Co-I; and
- A one page listing of any previous INTEGRAL grant awards, noting the mission cycle, program titles and proposal IDs, resulting publications, and/or a short synopsis of currently ongoing work.

These instructions supersede the instructions in Section 2.3 of the *Guidebook for Proposers*.

Prepare and submit 10 printed copies of the completed proposal to the address given below, by the due date listed. The Principal Investigator (PI) must sign the printed Cover Page and attach it as the front of the original of the proposal; copies of the signed Cover Page must be attached to the remaining 7 copies of the proposal.

The 10 hard copies of the completed proposal should be sent to:

“INTEGRAL Support Office”
NASA Peer Review Services
500 E Street SW, Suite 200
Washington D.C. 20024
Tel: 202-479-9030

2.2.3 Evaluation of Proposals submitted to the INTEGRAL Archival and Theoretical Research Program

Proposals will be evaluated by a peer evaluation panel with respect to the criteria specified in Section C.3 of the [Guidebook for Proposers](#), where it is understood that the intrinsic merit of a proposal shall include the following factors:

- The perceived scope and scientific merit of the investigation and its relevance to the INTEGRAL mission;
- The extent to which the investigation complements approved Guest Observer projects and enhances the anticipated science return from the mission;
- For archival investigations, the suitability of INTEGRAL data products for the proposed investigation; and
- For theoretical investigations, the degree to which the investigation directly advances the INTEGRAL mission science goals.

Within the review process, no specific prioritization or allocation will be established for archival versus theoretical efforts. The peer-review process will evaluate both types of proposals on an equal footing.

As described in Section 2.1 of this solicitation, requests for the support of U.S. INTEGRAL Guest Observers are solicited elsewhere. The evaluation of proposals for the support of U.S. INTEGRAL Guest Observers and proposals received in response to this solicitation will be conducted as a single NASA-convened peer review. A combined review will be beneficial to the overall NASA INTEGRAL program. In the event that the Guest Observer support budget is undersubscribed, the allotment for theory and archival support may be augmented. Note, however, that support of Guest Observers remains the highest priority.

2.3 Supplemental Information

- NOI Due Date: December 15, 2004
- Proposal Due Date: February 15, 2005

Technical questions concerning the INTEGRAL Archival and Theoretical Research Program may be directed to the INTEGRAL Guest Observer Facility:

Dr. Chris Shrader
Code 661
Building 2, Room 235
NASA Goddard Space Flight Center
National Aeronautics and Space Administration
Greenbelt, MD 20771-0001
Tel: (301) 286-8434
E-mail: Chris.R.Shrader@gsfc.nasa.gov

Programmatic information may be obtained from the INTEGRAL Program Officers:

Dr. Donald A. Kniffen
Universe Division
Science Mission Directorate
NASA Headquarters
Washington, DC 20546-0001
Tel: (202) 358-0351
E-mail: Donald.A.Kniffen@nasa.gov

Dr. Alan P. Smale
Universe Division
Science Mission Directorate
NASA Headquarters
Washington, DC 20546-0001
Tel: (202) 358-2016
E-mail: Alan.P.Smale@nasa.gov